

<b>Name:</b>	 <b>UPES</b> UNIVERSITY WITH A PURPOSE
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**

**End Semester Examination, December 2019**

**Course: Coal Bed Methane, Gas Hydrates and Shale Technology**

**Semester: III**

**Program: M.TECH PE**

**Time 03 hrs.**

**Course Code: PEAU 8001**

**Max. Marks: 100**

**Instructions: All questions are Mandatory.**

**SECTION A**

S. No.		Marks	CO
Q 1	What are Gas Hydrates?	4M	CO4
Q 2	Define the term “Rank of Coal”?	4M	CO3
Q 3	Explain the environmental impacts involved in shale gas development?	4M	CO1
Q 4	Explain the reason of having methane gas in Coal?	4M	CO2
Q 5	Shale gas is sometimes referred to as unconventional gas or as occurring in continuous gas accumulations. How is shale gas different from conventional oil and gas?	4M	CO1

**SECTION B**

Q 6	Explain the drivers to explore CBM reserves in India?	10M	CO3
Q 7	Illustrate the methods to determine the hydrate composition?	10M	CO4
Q 8	Explain in brief different stages involved in fracturing an unconventional gas reservoir?	10M	CO2

**(OR)**

Q 8	a) List and explain different parameters with ranges for having economical production from shale gas formations? b) Discuss the importance of multiple and multilateral well bore drilling with respect to unconventional gas reservoirs?	5M + 5M	CO1
Q 9	a) Discuss the environmental aspects of hydrates? b) Discuss the safety aspects of hydrates?	5M + 5M	CO4

**(OR)**

Q 9	a) What are the considerations needed for fracturing shale reservoirs? b) Describe the different methods for disposal of shale produced water?	6M + 4M	CO3
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**SECTION C**

Q 10	a) Discuss the importance of relative permeability in the evaluation of a CBM Well? b) Bring out the comparison between vertical drilling and horizontal drilling of coal bed wells?	10M + 10M	CO4
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Q 11	a) List out various green house gases and describe their damaging effect to the environment in brief? b) Describe any case study on carbon dioxide storage into unconventional gas reservoirs to reduce CO <sub>2</sub> emissions. Discuss in brief the objectives, challenges, advantages and scope involved in this kind of project?	<b>10M</b> + <b>10M</b>	<b>CO<sub>2</sub></b>
<b>(OR)</b>			
Q 11	List the major and minor industrial sectors responsible for carbon emission. Give the details of operations involved in it? Explain the following in brief, for these industrial activities 1) Sources of emission 2) Various ways of carbon management	<b>10M</b> + <b>10M</b>	<b>CO<sub>3</sub></b>